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**PETITION FOR REVIVAL OF AN INTERNATIONAL APPLICATION FOR PATENT
DESIGNATING THE U.S. ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(b)**Docket Number
(Optional)
12873.05197

First Named Inventor: Matthew R. Cerreto

International (PCT) Application No.: PCT/US03/07414

U.S. Application No.: 60/364,301
(if known)

Filed: March 11, 2003

Title: Adjustable Seating System

Attention: PCT Legal Staff
 Mail Stop PCT
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, VA 22313-1450

The above-identified application became abandoned as to the United States because the fees and documents required by 35 U.S.C. 371(c) were not filed prior to the expiration of the time set in 37 CFR 1.495(b) or (c) as applicable. The date of abandonment is the day after the date on which the 35 U.S.C. 371(c) requirements were due. See 37 CFR 1.495(h).

APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION

NOTE: A grantable petition requires the following items:

- (1) Petition fee
- (2) Proper reply
- (3) Terminal disclaimer with disclaimer fee which is required for all international applications having an international filing date before June 8, 1995; and
- (4) Statement that the entire delay was unintentional.

1. Petition fee

Small entity - fee \$ _____ (37 CFR 1.17(m)). Applicant claims small entity status.
 See 37 CFR 1.27.

Other than small entity - fee \$ 1,500 (37 CFR 1.17(m))

07/06/2005 ATRAN1 00000084 10540744

05 FC:1453 2. Proper reply 1500.00 0P

A. The proper reply (the missing 35 U.S.C. 371(c) requirement(s)) in the form of
APPLICATION PAPERS (identify type of reply):

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[Page 1 of 2]

This collection of information is required by 37 CFR 1.137(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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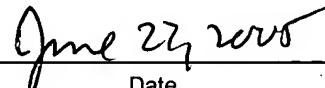
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Signature



Date

Paul E. Szabo

30,429

Typed or Printed Name

Registration Number, if applicable

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Address

Telephone Number

Cleveland, Ohio 44114-2688

Address

Enclosures: Response Fee Payment Terminal Disclaimer Other (please identify):

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From: Paul E. Szabo
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Client Number: 12873 **Matter Number:** 05197 **Client Name:** Invacare Corporation

Number of Pages: 52 including cover

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Message:

SEP 15 2005

Dear Debbie,

PCT SPECIAL
PROGRAMS OFFICE

Per your conversation with Christine Batman today, a copy of the Petition for Revival of an International Application filed June 22, 2005 follows.

Thank you for your attention to this matter.

Sincerely yours,

Paul Szabo, Esq.

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24024

PATENT**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:	Matthew R. Cerreto)	Examiner: Not yet assigned.
)	
Serial No.:	10/540,744)	Art Unit: Not yet assigned.
)	
Filed:	June 22, 2005)	Confirmation No.: 2401
)	
For:	ADJUSTABLE SEATING SYSTEM)	Attorney Docket No.: 12873.05197
)	

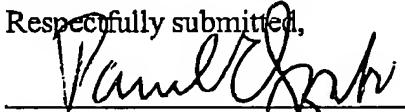
Mail Stop Amendment
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COMMUNICATION

Dear Ladies and Gentlemen:

On June 22, 2005, a Petition for Revival of an International Application was filed with the United States Patent and Trademark Office. A true and accurate copy of that filing is attached to this Communication. Please process as soon as possible.

Respectfully submitted,



Paul E. Szabo (Reg. No. 30,429)
Telephone: (216) 622-8578
Customer No. 24024

Deposited with the United States Postal Service with sufficient postage via U.S. First Class mail in an envelope addressed to Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, this 22nd day of June, 2005.

Re: Petition for Revival of an International Application
Inventor: Cerreto
For: **ADJUSTABLE SEATING SYSTEM**
Int'l. No.: PCT/US03/07414
Docket No. 12873.05197

Please acknowledge receipt of the following:

- Return receipt postcard
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- Transmittal Letter to the U.S. Designated/Elected Office (2 pages + duplicate)
- Petition for Revival of an International Application for Patent Designating the U.S. Abandoned unintentionally under 37 CFR 1.137(b) (2 pages + duplicate)
- International Published Application (27 pages)
- Executed Declaration of the Inventor (2 pages)
- PTO Form PTO-1595 (1 page + duplicate)
- Executed Assignment (2 pages)
- Information Disclosure Statement (3 pages)
- PTO/SB/08A and PTO/SB/08B (2 pages)
- One additional reference (4 pages)

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10/540744
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PTO/SB/84/PCT (12-04)

Approved for use through 03/31/2007. OMB 0651-0021

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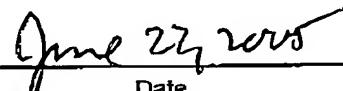
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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(51) International Patent Classification: A61G 5/00 (74) Agent: SZABO, Paul, E.; Calfee, Halter & Griswold LLP, 1400 McDonald Investment Center, 800 Superior Avenue, Cleveland, OH 44114 (US).

(21) International Application Number: PCT/US03/07414 (81) Designated States (national): AU, CA, NZ, US.

(22) International Filing Date: 11 March 2003 (11.03.2003) (84) Designated States (regional): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).

(25) Filing Language: English (26) Publication Language: English

(30) Priority Data: 60/364,301 13 March 2002 (13.03.2002) US

(71) Applicant (for all designated States except US): INVACARE CORPORATION [US/US]; One Invacare Way, Elyria, OH 44036 (US).

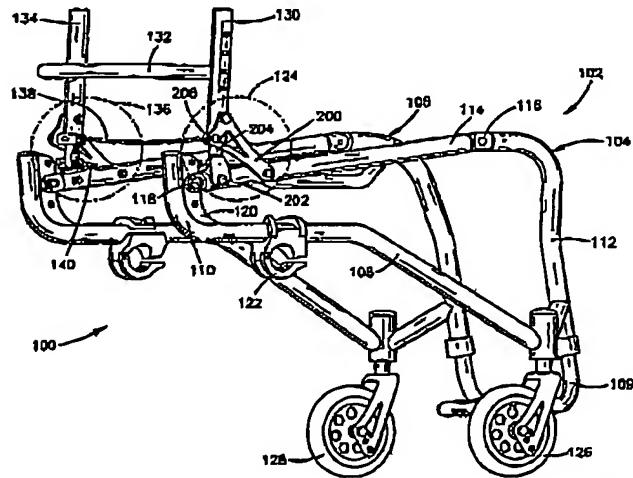
(72) Inventor; and
(75) Inventor/Applicant (for US only): CERRETO, Matthew, Robert [US/US]; 395 Annis Road, South Amherst, OH 44001 (US).

Declaration under Rule 4.17:
— of inventorship (Rule 4.17(iv)) for US only

Published:
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ADJUSTABLE SEATING SYSTEM



WO 03/077817 A1

(57) Abstract: A wheelchair includes a seat back and a frame rail. The seat back can be moved relative to the frame rail between a folded position and an unfolded and locked position. A first releasable locking mechanism releasably locks the seat back in the unfolded and locked position. A second releasable locking mechanism releasably locks the seat back at any selected one of a plurality of different angles relative to the frame rail. The seat back can be folded and unfolded without adjusting the seat back angle. The seat back has a portion that slides along the frame rail as the seat back angle is adjusted. The length of the seat back varies as the seat back angle is adjusted. The seat back includes a back cane that is pivotally connected with the frame rail by a pivot bracket. The back cane is fixedly connected to the pivot bracket. The pivot bracket pivots relative to the frame rail when the seat back is moved from the unfolded position to the folded position.

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ADJUSTABLE SEATING SYSTEMRelated Application

This application claims the benefit of U.S. Provisional Application No. 60/364,301 filed March 13, 2002.

Field of the Invention

The present invention is directed to wheelchairs and, more particularly, to seating systems for wheelchairs.

Background of the Invention

Adjustable seating systems are important features of wheelchairs. The adjustability of such seating systems allows a user of the wheelchair to adjust various aspects of the seating system in order to provide the most comfortable seating arrangement. However, prior art adjustable seating systems suffer from several disadvantages. For example, some adjustable seating systems require the use of tools and detailed instructions typically only found in the wheelchair owner's manual to affect a seat adjustment. Such systems are often confusing and non-intuitive to the wheelchair user. Other adjustable seating systems do not provide independent adjustability. For example, some adjustable seating systems provide a folding seat back mechanism that, when used, changes or resets other adjustable seating system features such as the seat-back angle adjustment.

US Patent No. 6,311,999 discloses a wheelchair seat in which the angle of the seat back is adjustable relative to the seat bottom cushion, and the seat back can be folded down flat (forward) onto the seat bottom cushion, while retaining the seat back adjustment angle.

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Summary of the Invention

The present invention relates to a wheelchair that includes a seat back and a frame rail. The seat back can be moved relative to the frame rail between a folded position and an unfolded and locked position. A first releasable locking mechanism releasably locks the seat back in the unfolded and locked position. A second releasable locking mechanism releasably locks the seat back at any selected one of a plurality of different angles relative to the frame rail. The seat back can be folded and unfolded without adjusting the seat back angle.

The seat back has a portion that slides along the frame rail as the seat back angle is adjusted. The length of the seat back varies as the seat back angle is adjusted. The seat back includes a back cane that is pivotally connected with the frame rail by a pivot bracket. The back cane is fixedly connected to the pivot bracket. The pivot bracket pivots relative to the frame rail when the seat back is moved from the unfolded position to the folded position.

Brief Description of the Drawings

The foregoing and other features of the present invention will become apparent to one skilled in the art to which the present invention relates upon consideration of the following description of the invention with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a portion of a wheelchair frame including a seat back adjustment mechanism in accordance with the present invention;

Fig. 2A is an exploded perspective view of the seat back adjustment mechanism;

Fig. 2B is an exploded perspective view of selected parts of the seat back adjustment mechanism;

Fig. 3 is a side elevational view of the seat back adjustment mechanism, shown in a first position;

Fig. 4 is a rear elevational view of the seat back adjustment mechanism, shown in a first position;

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Fig. 5 is a view similar to Fig. 4 showing the seat back adjustment mechanism in a second or folded position;

Fig. 6 is a side elevational view of the seat back adjustment mechanism, shown in the second or folded position;

Figs. 7-9 are a series side elevational views showing the seat back adjustment mechanism supporting the seat back in different angular orientations;

Fig. 10 is a sectional view of a portion of the seat back adjustment mechanism; and

Fig. 11 is another sectional view of a portion of the seat back adjustment mechanism, taken along line 11-11 of Fig. 10.

Detailed Description

Fig. 1 is a perspective view of a wheelchair 100 incorporating one embodiment of a seat back fold-down and adjustable seat back angle mechanism in accordance with the present invention. Wheelchair 100 has a frame 102 that includes a first side frame 104 and a second side frame 106. Side frames 104 and 106 are mirror constructions of each other and, therefore, only side frame 104 will be discussed in particular with the understanding that the discussion equally applies to side frame 106.

Side frame 104 has frame portions 108, 110, and 112 collectively forming a lower side frame portion. Side frame 104 further has a frame portion 114 that is pivotally connected to frame portion 112 via pivotal connection 116. Frame portion 114 forms an upper side frame portion. Pivotal connection 116 has a pivot lug assembly that includes a pivot lug fork, pivot lug, and a pivot pin for inserting through the pivot lug fork and pivot lug. For example, one such suitable pivot lug assembly is described in US Patent No. 5,267,745 to Robertson et al., which is hereby fully incorporated by reference. Preferably, the pivot lug fork is rigidly attached to frame portion 112 and the pivot lug is rigidly attached to a first end of frame portion 114. Frame portion 114 further has a second end that includes fork member 118. Fork member 118 is

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configured to accept a seat-angle adjust plate 120 between its fork members. Seat-angle adjust plate 120 is rigidly affixed to frame portion 110 and includes a plurality of vertically spaced-apart mounting holes that are used to secure fork member 118 with a nut and bolt fastener. Configured as such, the angle of frame portion 114 can be adjusted by pivoting frame portion 114 about pivotal connection 116 and securing such angle by appropriately fastening fork member 118 to seat-angle adjust plate 120.

A clamp 122 is provided on frame portion 108 for attaching an axle tube thereto resulting in the axle tube being connected between side frames 104 and 106 by a similar clamp on side frame 106. One such suitable clamp and axle tube assembly is described in US Patent No. 5,851,018 to Curran et al., which is hereby fully incorporated by reference. The axle tube is used to secure the left and right-side drive wheels to wheelchair 100 for propulsion. The axle tube also provides additional rigidity to frame 102 between side frames 104 and 106. In this regard, a footrest 109 is also provided that interfaces with frame portion 112 and its equivalent in side frame 106 to provide further rigidity to wheelchair 100.

Wheelchair 100 further includes a seat back fold-down mechanism and an adjustable seat back angle mechanism, collectively shown as 124. Side frame 106 includes a similar seat back fold-down and adjustable seat back angle mechanism, collectively shown as 136, which is of mirror construction to seat back fold-down and adjustable seat back angle mechanism 124. In this regard, a seat back assembly 135 is provided that includes a seat back cushion (not shown) that is preferably removably affixed to a set of back canes 130 and 134. The seat back fold-down and adjustable seat back angle mechanisms 124 and 136 connect the back canes 130 and 134 to frame 102 via frame portion 114 and its equivalent in side frame 106. A handle bar 132 is provided between back canes 130 and 134 to provide rigidity between the back canes 130 and 134 and to enable folding the seat back toward the frame portion 114 or unfolding the seat back away from frame portion 114.

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Fig. 2A shows an exploded view of the seat back 135 fold-down and adjustable seat back angle mechanism 124. Figure 2B is a reverse-angle exploded perspective of Figure 2A that further illustrates the features of the present embodiment. In Figure 2B, the fasteners are not shown for the sake of clarity in illustrating the remaining components.

The seat back fold-down and adjustable seat back angle mechanism 124 includes a pivot bracket 200, a stop block 202, a back angle adjustment rod 204, and a bar-slide coupling 206. The seat back 135 includes the back cane 130 and the back cane adjustment rod 204 and the bar slide coupling 206.

The pivot bracket 200 (Fig. 2A) is an elongated triangular member having three vertices or end portions 140, 142 and 144. Each one of the vertices 140-144 of the pivot bracket 200 has a respective fastener opening in the form of a through hole.

The stop block 202 (Figs. 3 and 4) is a solid member having an arcuate bearing surface 306 adapted to fit closely over the rail 114. The stop block 200 also has a pin channel 302 disposed above the bearing surface 306. The pin channel 302 extends in a front to back direction when the stop block 200 is mounted on the frame rail 114.

The stop block 200 further has a cam surface 304 disposed above the pin channel 302. The stop block 200 also has a planar bearing surface 308 that is disposed below the pin channel 302. The bearing surface 308 partially defines an adjustment bar channel 309, in the stop block 200, that extends parallel to the pin channel 302.

The back angle adjustment rod 204 is a solid member that has a longitudinally extending slot 234 that extends completely through (radially across) the rod. A stepped bore 310 extends downwardly from the slot 234. The bore 310 does not extend completely through (radially across) the rod 204, but instead is only present on one side (the inside) of the rod.

The stepped bore 310 comprises a plurality of interconnecting circular apertures 311 configured to receive a plunger pin. It should be understood that the particular geometry of bore

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310 is not important so long as it is configured to allow a plunger pin to lock in a selected one of the apertures 311 of the bore 310. Hence, the bore 310 can be implemented using, for example, rectangular, square, oval, or triangular geometries.

The back angle adjustment rod 204 has a lower end portion 156. The lower end portion 156 of the back angle adjustment rod 204 includes a threaded bore 205 that extends completely through (radially across) the lower end portion. The lower end portion 156 has an arcuate lower end surface or bearing surface 219.

The bar slide coupling 206 has a hollow tubular configuration including a central passage 158 (Figs. 2A and 2B) that extends completely through the bar slide coupling. The bar slide coupling 206 has a hollow tubular sleeve portion 207 with a radially extending fastener opening 211. A base portion 203 of the bar slide coupling 206 extends downward from the sleeve portion 207. The base portion 203 has on its outside a fastener opening in the form of a threaded bore 162. The base portion 203 has on its inside a fastener opening in the form of a threaded bore 166. The threaded bore 166 opens into the central passage 158 in the base portion 203 of the bar slide coupling 206.

In assembly of the mechanism 124, the sleeve portion 207 of the bar slide coupling 206 is inserted into the tubular lower end portion of the back cane 130. The fastener opening 211 in the sleeve portion 207 of the bar slide coupling 206 aligns with a fastener opening 215 in the back cane 130. The base portion 203 of the bar slide coupling 206 extends outside of and below the back cane 130.

The back angle adjustment rod 204 (Figs. 2A and 2B) is slid into the passage 158 in the bar slide coupling 206. The upper slot 234 in the back angle adjustment rod 204 aligns with the opening 211 in the bar slide coupling 206. Portions of the back angle adjustment rod 204, including the stepped bore 310 and the bore 205, project downward out of the bar slide coupling 206.

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The second or upper end portion 142 of the pivot bracket 200 is then placed adjacent to the back cane 130. A bolt 212 is placed through the fastener opening in the upper end portion 142 of the pivot bracket 200 and through the opening 215 in the back cane 130. The bolt 212 extends through the fastener opening 211 in the sleeve portion 207 of the bar slide coupling 206. The bolt 212 also extends through the upper slot 234 in the back angle adjustment rod 204.

A nut 213 is secured on the bolt 212. The upper end portion 142 of the pivot bracket 200, and the back cane 130, are thus permanently connected to each other by the bolt 212. The bolt 212 also secures the bar slide coupling 206 permanently in place in the lower end of the back cane 130.

The back angle adjustment rod 204 is supported for sliding movement in the bar slide coupling 206 and in the back cane 130. The engagement of the bolt 212 with the ends of the slot 234 prevents the back angle adjustment rod 204 from coming out the back cane 130.

Separately, the first or forward end portion 140 of the pivot bracket 200 is secured to the frame rail 114, at a location forward of the upper end portion 142, by a forward bolt 208 and a nut 209. The pivot bracket 200 is thus supported on the rail 114 for pivotal movement relative to the rail about the forward bolt 208. As a result, the lower end portion of the back cane 130, the bar slide coupling 206 and the back angle adjustment rod 204, which are connected with each other and with the upper end portion 142 of the pivot bracket 200 by the bolt 212, are also supported by the pivot bracket for pivotal movement relative to the rail 114 about the forward bolt 208.

Separately, the bar slide coupling 206 is secured to the pivot bracket 200 by a lower bolt 210. The lower bolt 210 extends through the fastener opening in the lower end portion 144 of the pivot bracket 200 and is screwed into the threaded bore 162 in the bar slide coupling 206. As a result, the pivot bracket 200 and the bar slide coupling 206 are permanently connected to each other by the lower bolt 210.

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The pivot bracket 200 is thus secured to the bar slide coupling 206 by the lower bolt 208; is secured to the back cane 130 by the upper bolt 212; and is pivotally secured to the rail 114 by the forward bolt 208.

The assembly of the back cane 130 and the back cane adjustment rod 204 is connected with the pivot bracket 200 at two locations along its length, i.e., at the upper bolt 212 and the lower bolt 210. As a result, the back cane 130 and the back cane adjustment rod 204 are fixed to the pivot bracket for movement with the pivot bracket relative to the frame rail 114. The back cane 130 does not pivot relative to the pivot bracket 200.

Also separately, the stop block 202 is fixedly secured to the rail 114 by a bolt 214 and a nut 216, at a location rearward of the forward bolt 208. The curved bearing surface 306 on the stop block 202 overlies the curved outer surface of the rail 114. The pin channel 302 and the adjustment channel 309 on the stop block 202 are disposed above the rail 114. The flat bearing surface 308 on the stop block faces upwardly. The cam surface 304 on the stop block 202 also faces upwardly.

A lower plunger pin assembly 217 is mounted on the back angle adjustment rod 304. The lower plunger pin assembly 217 includes a pull ring 218, an externally threaded plunger housing 220, a compression spring 222, and a plunger pin 224. The plunger housing 220 is screwed into the threaded bore 205 in the lower end portion 217 of the back angle adjustment bar 204. As a result, the lower plunger pin assembly 217 is fixed in and movable with the back angle adjustment bar 204. The lower plunger pin assembly 217 constitutes a first releasable locking mechanism of the adjustment mechanism 124.

In assembly, the lower end portion 156 of the back angle adjustment bar 304, with the lower plunger pin assembly 217 affixed thereon, is positioned adjacent the stop block 202. The arcuate lower end surface 219 of the back angle adjustment bar 304 abuttingly engages the flat

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bearing surface 308 on the stop block 202 to transmit vertical load from the back cane 130 to the stop block 202 and thereby the frame rail 114.

The plunger pin 224 extends through the lower end portion 156 of the back angle adjustment bar 304 and into the pin channel 302 on the stop block 202. The engagement of the plunger pin 224 in the pin channel 302 of the stop block 202 prevents the back cane adjustment rod 204 from moving upwardly (as viewed in Figs. 3 and 4) relative to and off the stop block. This prevents the back angle adjustment bar 304 from being pulled off the rail 114 and thus prevents the back cane 130 and the entire seat back from being folded forward onto the seat bottom cushion.

The wheelchair also includes an upper plunger pin assembly 225. The upper plunger pin assembly 225 includes a pull ring 226, an externally threaded plunger housing 228, a compression spring 230, and a plunger pin 232. The plunger housing 220 is screwed into the threaded bore 166 in the base portion 203 of the bar slide coupling 206. As a result, the upper plunger pin assembly 225 is fixed in and movable with the bar slide coupling 206. The upper plunger pin assembly 225 constitutes a second releasable locking mechanism of the adjustment mechanism 124.

The plunger pin 232 extends completely through the threaded bore 166 in the bar slide coupling 206 and radially into the passage 158 in the bar slide coupling. Because the back cane adjustment rod 204 extends axially through the passage 158 in the bar slide coupling 206, the plunger 232 pin thus extends radially into the stepped lower slot 310 of the back angle adjustment bar.

The plunger 232 pin is received in and engages in one of the apertures 311 of the lower slot 310 of the back cane adjustment rod 204. This engagement prevents the back cane adjustment rod 204 from moving vertically (axially), relative to and inside of, the bar slide coupling 206. Because the bar slide coupling 206 is fixed in position vertically in the back cane

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130 by the bolt 212, the plunger pin 232 thus blocks axial movement of the back cane adjustment rod 204 in the back cane 130.

The upper plunger pin assembly 225 thus fixes the relative vertical position of the back cane adjustment rod 204 in the back cane 130. Selecting an opening 311 in the back cane adjustment rod 204 for receiving the plunger pin 232, as described below, can adjust the angle (tilt) of the seat back relative to the frame rails 114.

If it is desired to fold the seat back assembly forward onto the seat bottom cushion and frame rail 114 (see Figs. 3-6), the pull ring 218 of the lower plunger pin assembly 217 is pulled away from its housing 220. The plunger pin 224 moves horizontally out of the pin channel 302 on the stop block, as is shown in Fig. 5. As a result, the pivot bracket 200 is freely pivotable relative to the frame rail 114 about the forward bolt 208. Thus, the back cane adjustment rod 130 and the back cane 204, which are connected with the pivot bracket 200 by the bolts 210 and 212, are free to move relative to the stop block 202 and, therefore, relative to the frame rail 114 on which the stop block is affixed. The seat back assembly, which remains pivotally connected to the rail 114 by the pivot bracket 200 and the bolt 208, can then be tipped forward, pivoting around the bolt 208. The parts move to the folded position shown in Fig. 6.

To unfold and lock the seat back, the seat back assembly is moved back from the position shown in Fig. 6 to the position shown in Figs. 3 and 4. As this movement occurs, the tip of the plunger pin 224 engages the cam surface 304 on the stop block 202. The cam surface 304 cams and retracts the plunger pin 224 into the housing 220 so that the plunger pin can move into a position laterally adjacent to the pin channel 302 in the stop block 202.

The plunger pin 224 enters vertically into the pin channel 302 on the stop block 202 and, under the force of the spring 222, is pushed outward of the housing 220 (horizontally) into engagement with the surfaces defining the pin channel in the stop block. The engagement of the plunger pin 224 in the pin channel 302 connects the lower plunger pin assembly 217 with the

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stop block 202. Because the lower plunger pin assembly 217 is secured to the back cane adjustment rod 204, this engagement also secures the back angle adjustment bar to the stop block 202. Because the back cane adjustment rod 204 is secured to the back cane 130, the back cane is thus secured to the stop block 202. The seat back assembly is thus unfolded and secured again to the rail 114 and can not be folded forward without locking again.

When the seat back assembly is, in this manner, being folded forward or back, the adjustment of the upper plunger pin assembly 225 in the stepped slot 310 is not affected. The plunger pin 232 remains fully in the selected aperture 311 of the stepped slot 310, without change. Thus, the angle of the seat back relative to the lower rail 114 is not affected.

The plunger pin 232 can selectively be placed in any one of the apertures 311 of the lower slot 310 of the back cane adjustment rod 204. When this occurs, the tilt of the seat back changes, thus changing the angle of the seat back relative to the seat bottom cushion.

Specifically, when the pull ring 226 of the upper plunger pin assembly 225 is pulled, the plunger pin 232 is pulled laterally out of the stepped bore 310 in the back angle adjustment bar 130. The assembly of the back cane 204 and the bar slide coupling 206 is then free to move vertically relative to the back cane adjustment rod 204, which is held in position on the frame rail 114 by the lower plunger pin assembly 217.

A downward force may be applied to the back cane 130, for example, through the handle bar 134 (Fig. 1). This force causes the back cane 130, the bar slide coupling 206, and the upper plunger pin assembly 225 to move downward in a telescopic fashion along the back cane adjustment rod 204.

Once the desired seat back angle is achieved, the plunger ring 226 is released and the plunger pin 232 is allowed to move back, under the force of the spring 230, into the selected aperture 311 of the stepped bore 310. This engagement locks the parts together and sets the angle of the seat back relative to the seat bottom cushion. It should be understood that an upward

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force could also be applied to the back cane 130, bar-slide coupling 206, and plunger pin assembly 225, resulting in an angle adjustment in the opposite direction.

As the back cane 130 moves upward and downward along the back cane adjustment rod 204, the length of the seat back 135 varies, and the angle of the seat back including the back cane, relative to the frame rail 114, changes. This change occurs because the lower end portion 156 of the back cane adjustment rod 204 is blocked from vertical movement relative to the rail 114 by the engagement of the plunger pin 224 in the pin channel 302 of the stop block 202.

The plunger pin 232 is, however, free to move laterally along the fore-and-aft length of the pin channel 302 in the stop block 202. Therefore, as the angle between the back cane 130 and the frame rail 114 is adjusted as described above, the pivot bracket 200 pivots relative to both the back cane 130 and the frame rail 114, as can be seen in the series of views shown in Fig. 7-9 showing different positions of such angular adjustment. The plunger pin 232 moves laterally along the length of the channel 302 in the stop block 202, as the lower end portion 156 of the back cane adjustment rod 204 slides forward or rearward in the channel 309 and along the bearing surface 306 of the stop block which is fixed to the rail 114. In addition, the bolt 212 moves vertically in the upper slot 210 in the back cane adjustment rod 204.

This adjustment of the angle of the seat back assembly is effected without detaching the lower plunger pin assembly 217 including the plunger pin 224 from the stop block 202 in the manner described above with reference to the fold-down feature of the wheelchair. Conversely, the fold-down feature can be utilized without affecting the particular setting of the seat back angle, because the plunger pin 232 remains in the selected aperture 311 in the stepped bore 310.

The bolt 212 extends completely through the upper slot 234 in the back cane adjustment rod 204, as well as through the fastener opening 215 in the back cane 130. The bolt 212 thus limits the extent of relative telescoping movement of the back cane adjustment rod 204 and the back cane 130, setting the extremes of such movement. The bolt 212 also prevents the back cane

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adjustment rod 204 from being pulled completely out of the back cane 130 when the plunger pin 232 is not engaged in any of the apertures 311 of the slot 310 of the back angle adjustment bar.

A pull cable 138 (Fig. 1) is provided between the respective lower plunger pin assemblies 217 of the two seat back fold-down mechanisms 124 and 136. By pulling on the pull cable 138 and simultaneously applying either an upward or downward force to the handlebar 132, a user can modify or change the seat back angle adjustment of the back canes 130 and 134. As such, the seat back angle adjustment function can be performed in a simple intuitive manner and without the use of tools.

Similarly, a pull cable 140 is provided between the upper plunger pin assemblies 225 of the two seat back fold-down mechanisms 124 and 136. By pulling on the pull cable 140 and simultaneously applying a forward force to the handlebar 132, a user can release the seat back canes 130 and 134 from their locked state and fold them down towards frame portion 114. As such, the seat back fold-down function can be performed in a simple intuitive manner and without the use of tools.

Hence, the illustrated embodiment of the present invention provides independent seat back fold-down functionality and seat back angle adjustment functionality. In particular, the seat back can be folded down, or raised from a folded down portion, without disturbing the seat back angle adjustment. Such a feature is accomplished by mounting or attaching the seat back angle adjustment mechanism to a pivot bracket that is incorporated into the seat back fold-down function. As the pivot bracket pivots to accomplish the fold-down function, the seat back angle adjustment mechanism undergoes a corresponding motion without a change in its adjustment setting.

While the present invention has been illustrated by the description of embodiments thereof, and while the embodiments have been described in considerable detail, it is not the intention of the applicant to restrict or in any way limit the scope of the appended claims to such

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detail. Additional advantages and modifications will readily appear to those skilled in the art.

For example, other type of releasable latches can be employed instead of plunger pins (e.g., nut and bolt fasteners), channel 302 in stop block 202 can have closed ends, and various components can be made to differing measurements or proportions than shown herein. Therefore, the invention, in its broader aspects, is not limited to the specific details, the representative apparatus, and illustrative examples shown and described. Accordingly, departures can be made from such details without departing from the spirit or scope of the applicant's general inventive concept.

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Claims

Having described the invention, we claim:

1. A wheelchair including:

a seat back;

a frame rail;

a seat back fold-down mechanism supporting said seat back for folding movement relative to said frame rail between a folded position and an unfolded and locked position, said seat back fold-down mechanism including a first releasable locking mechanism for releasably locking said seat back in the unfolded and locked position; and

a seat back angle adjustment mechanism for adjusting the angle of said seat back relative to said frame rail when said seat back is in the unfolded and locked position, said seat back angle adjustment mechanism including a second releasable locking mechanism for releasably locking said seat back at any selected one of a plurality of different angles relative to said frame rail;

said seat back fold-down mechanism enabling folding movement of said seat back between the folded position and the unfolded and locked position without releasing said second releasable locking mechanism when said seat back is locked in any selected one of the plurality of different angles relative to said frame rail;

said seat back having a portion that slides along said frame rail as the seat back angle is adjusted.

2. A wheelchair as set forth in claim 1 wherein the length of said seat back varies as the seat back angle is adjusted.

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3. A wheelchair as set forth in claim 2 wherein said seat back is pivotally connected with said frame rail by a pivot bracket, said seat back being fixedly connected to said pivot bracket, said pivot bracket pivoting relative to said frame rail when said seat back is moved from the unfolded position to the folded position.

4. A wheelchair as set forth in claim 1 wherein said first releasable locking mechanism includes a first plunger pin assembly having a plunger pin engageable in a track on said frame rail, and said second releasable locking mechanism includes a second plunger pin assembly having a plunger pin that is selectively engageable in any one of a plurality of spaced apertures on said seat back.

5. A wheelchair including:

a seat back;

a frame rail;

a seat back fold-down mechanism supporting said seat back for folding movement relative to said frame rail between a folded position and an unfolded and locked position, said seat back fold-down mechanism including a first releasable locking mechanism for releasably locking said seat back in the unfolded and locked position; and

a seat back angle adjustment mechanism for adjusting the angle of said seat back relative to said frame rail when said seat back is in the unfolded and locked position, said seat back angle adjustment mechanism including a second releasable locking mechanism for releasably locking said seat back at any selected one of a plurality of different angles relative to said frame rail;

said seat back fold-down mechanism enabling folding movement of said seat back between the folded position and the unfolded and locked position without releasing said second

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releasable locking mechanism when said seat back is locked in any selected one of the plurality of different angles relative to said frame rail;
said seat back having a length that varies as the seat back angle is adjusted.

6. A wheelchair including:

a seat back;

a frame rail;

a seat back fold-down mechanism supporting said seat back for folding movement relative to said frame rail between a folded position and an unfolded and locked position, said seat back fold-down mechanism including a first releasable locking mechanism for releasably locking said seat back in the unfolded and locked position; and

a seat back angle adjustment mechanism for adjusting the angle of said seat back relative to said frame rail when said seat back is in the unfolded and locked position, said seat back angle adjustment mechanism including a second releasable locking mechanism for releasably locking said seat back at any selected one of a plurality of different angles relative to said frame rail;

said seat back fold-down mechanism enabling folding movement of said seat back between the folded position and the unfolded and locked position without releasing said second releasable locking mechanism when said seat back is locked in any selected one of the plurality of different angles relative to said frame rail;

said seat back including a back cane that is pivotally connected with said frame rail by a pivot bracket, said back cane being fixedly connected to said pivot bracket, said pivot bracket pivoting relative to said frame rail when said seat back is moved from the unfolded position to the folded position.

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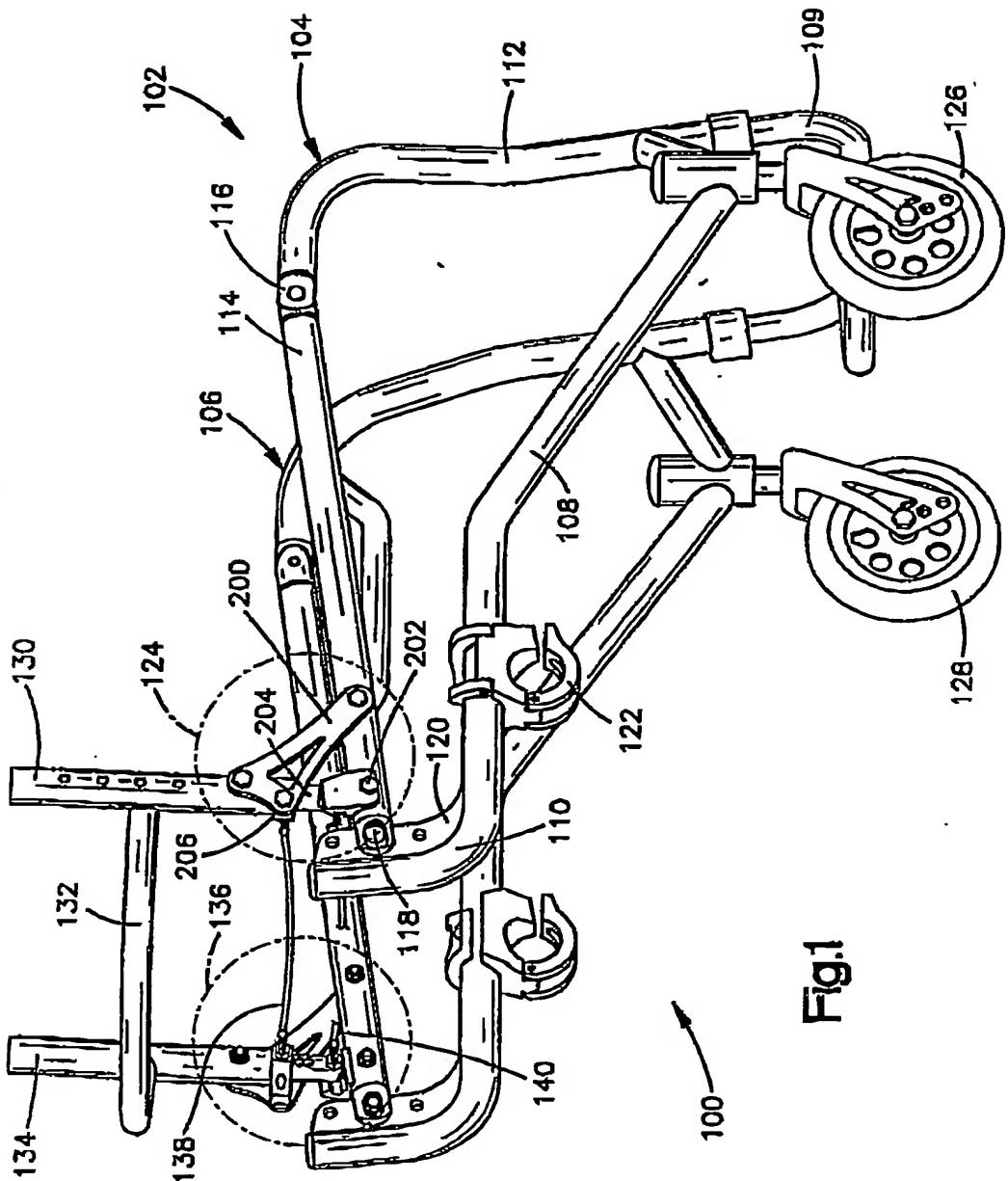


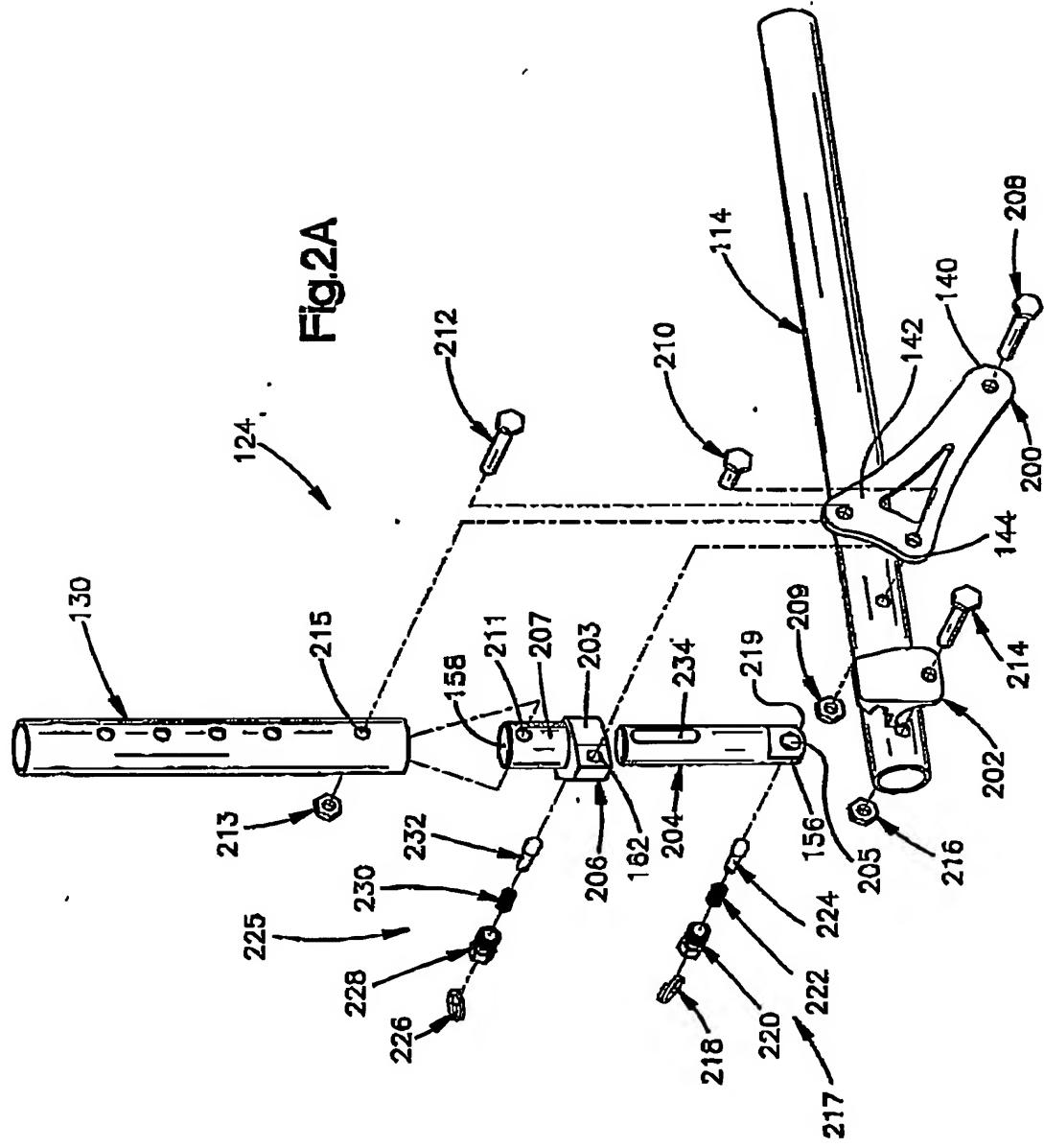
Fig.1

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Fig.2A



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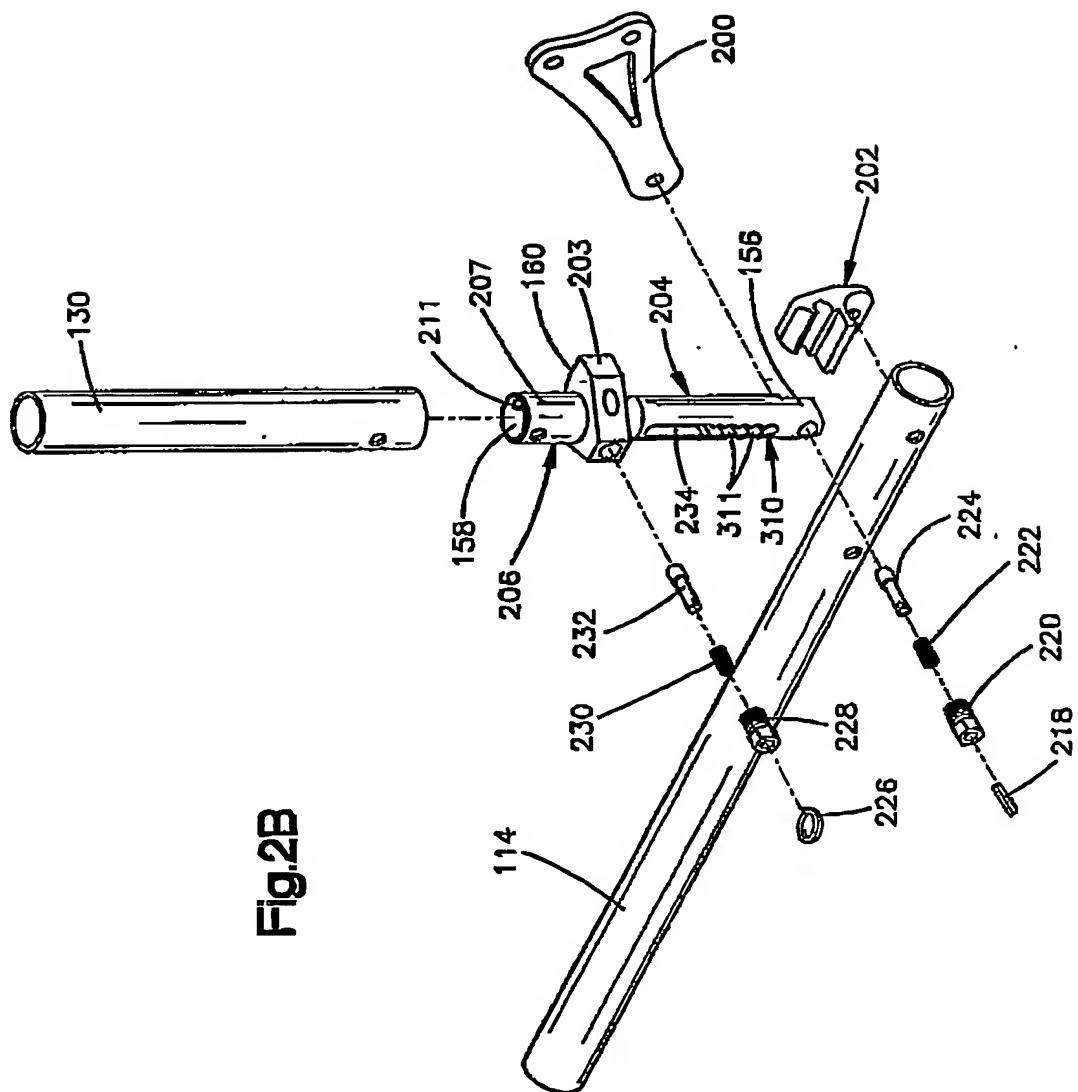
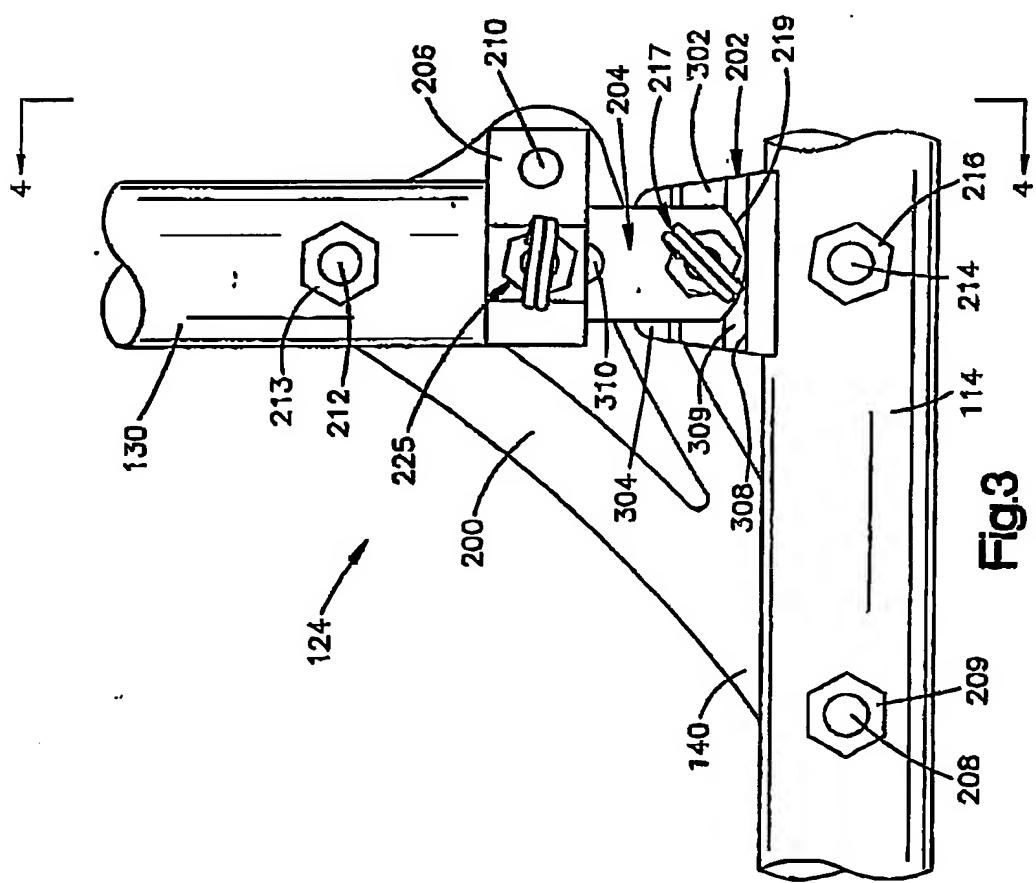
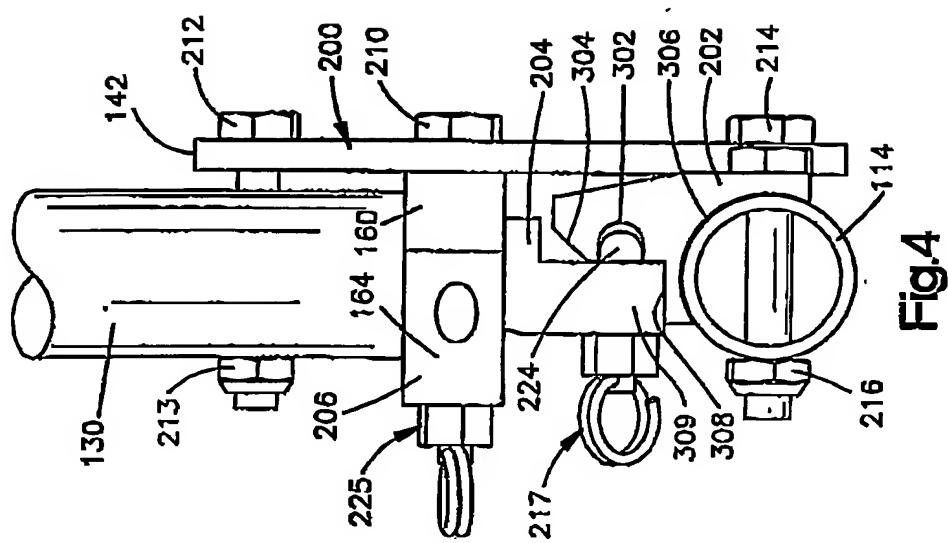


Fig 2B

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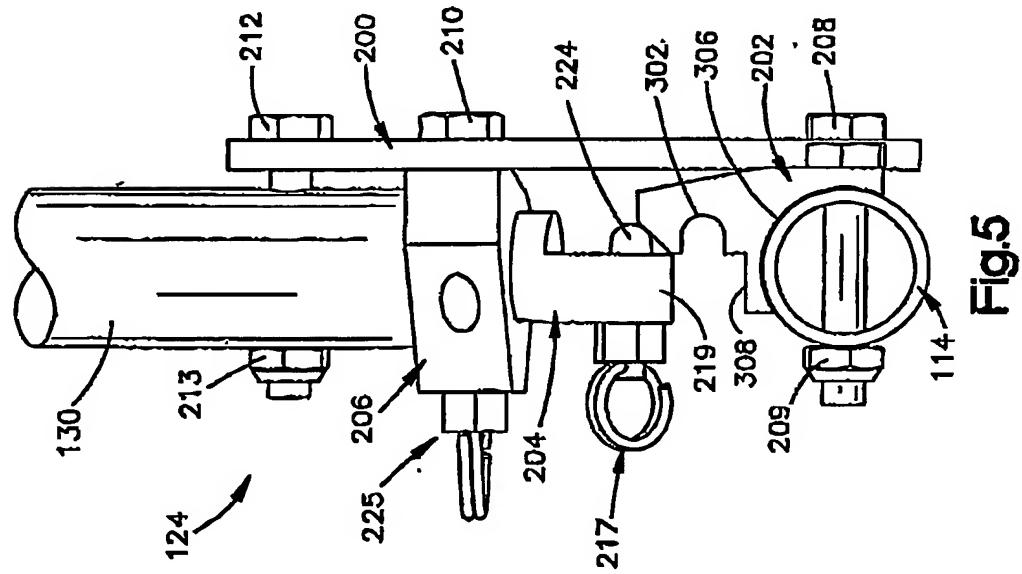
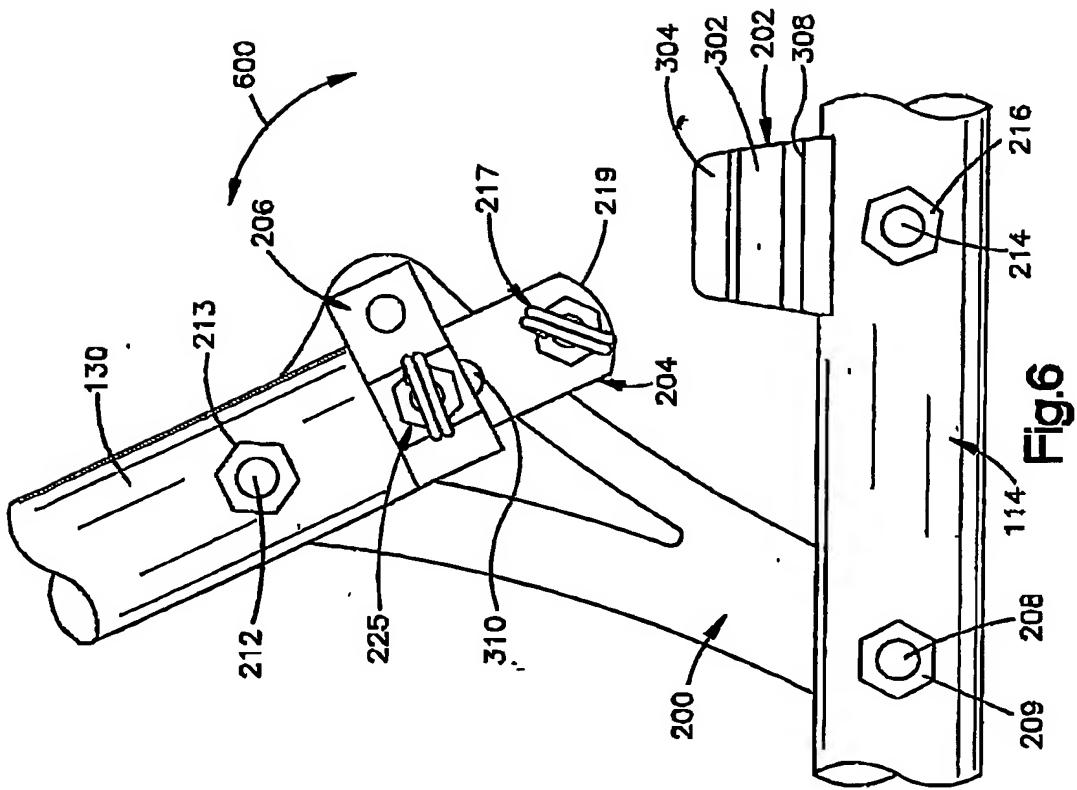
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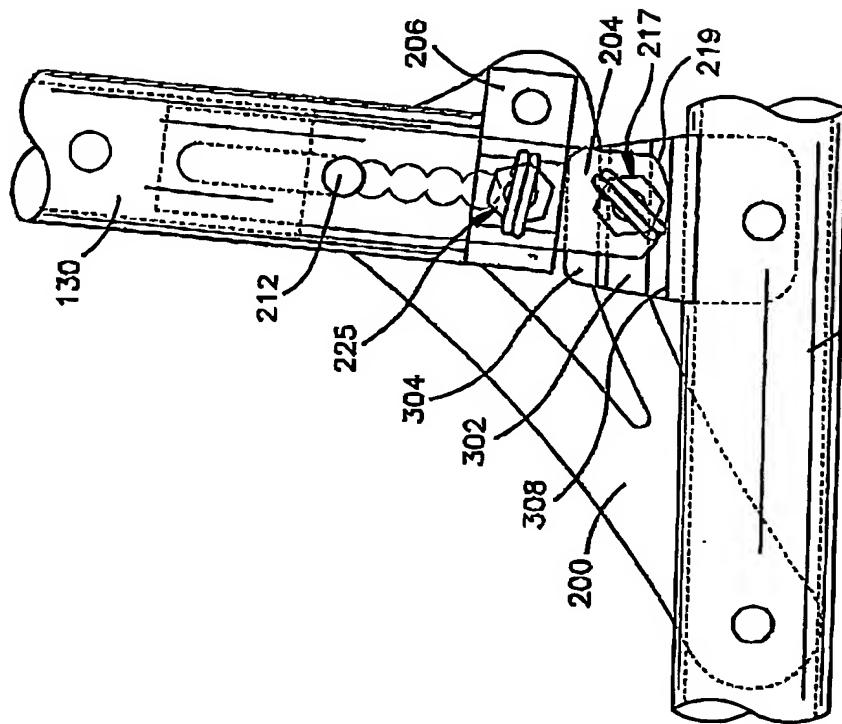


Fig.8

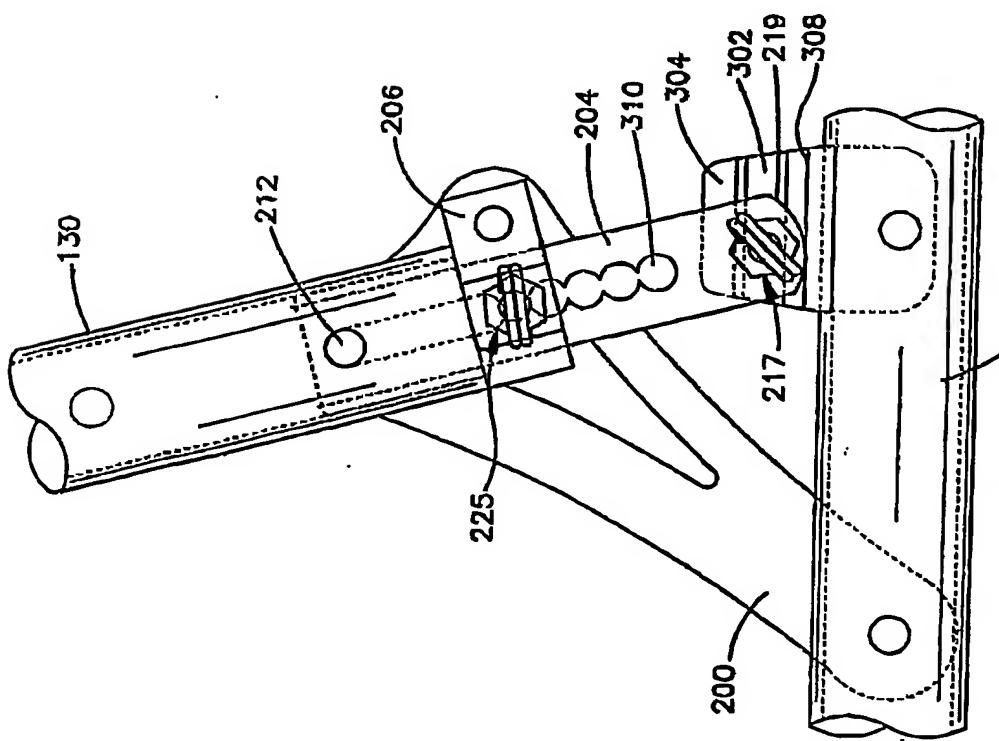
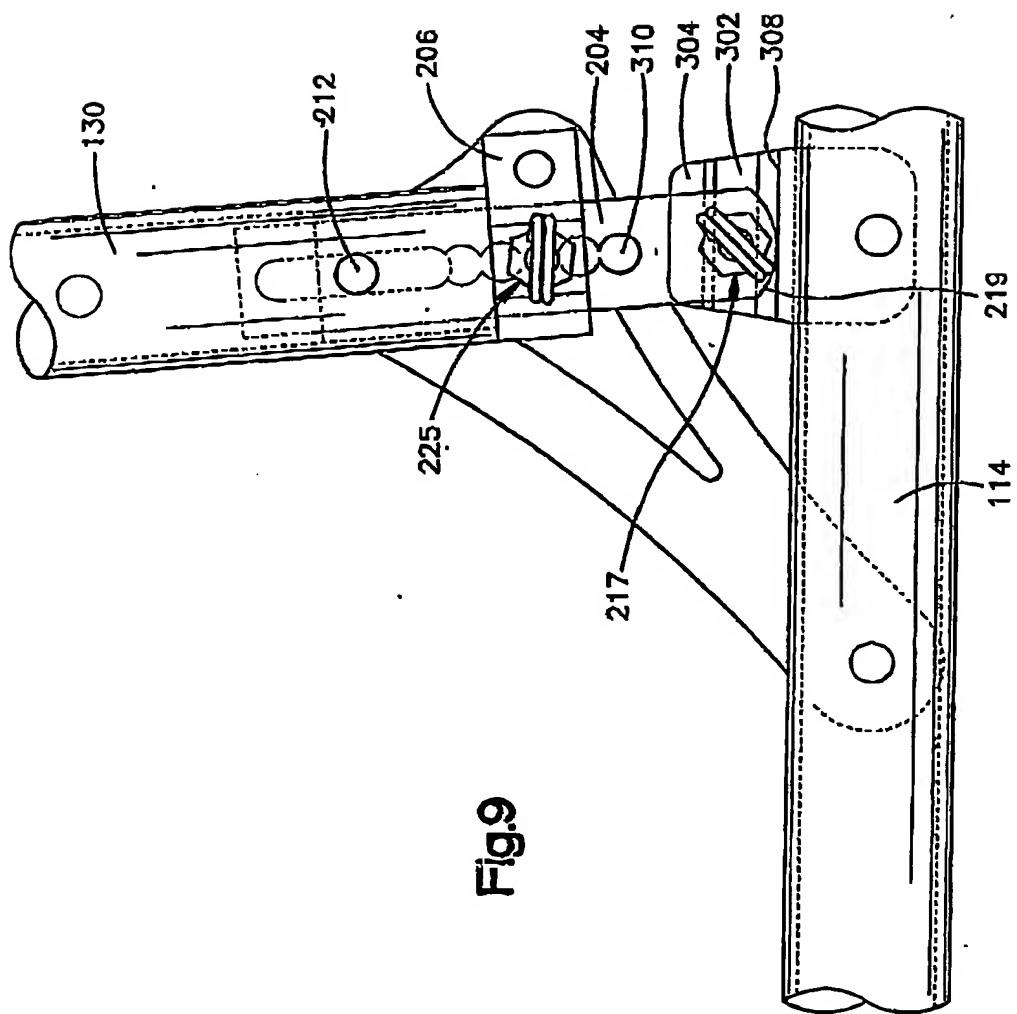


Fig.7

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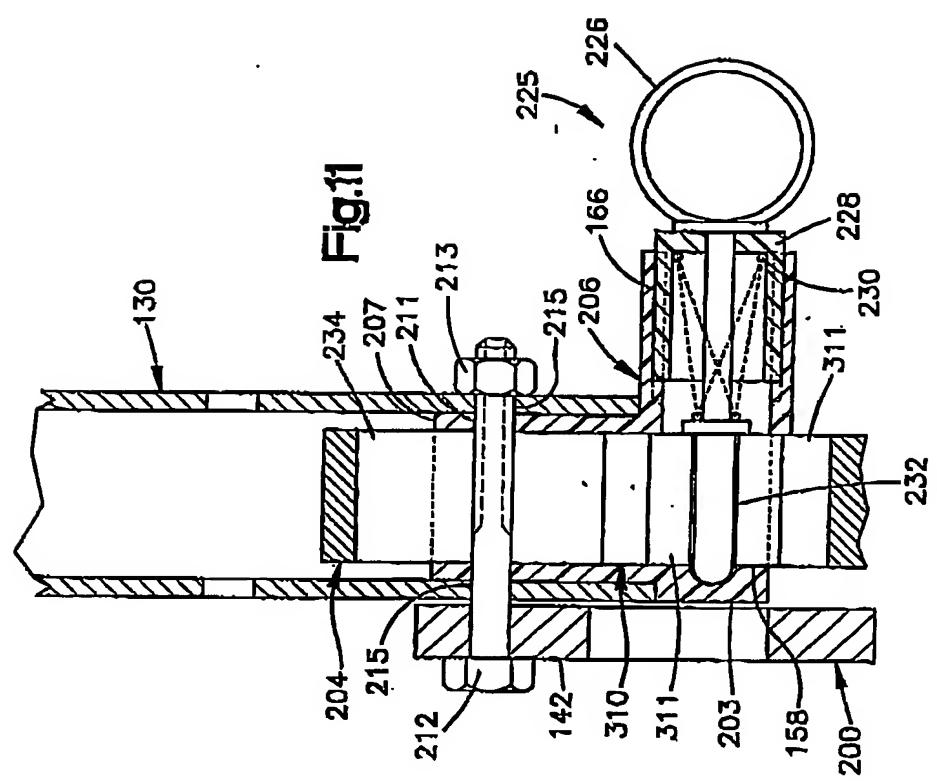


Fig.11

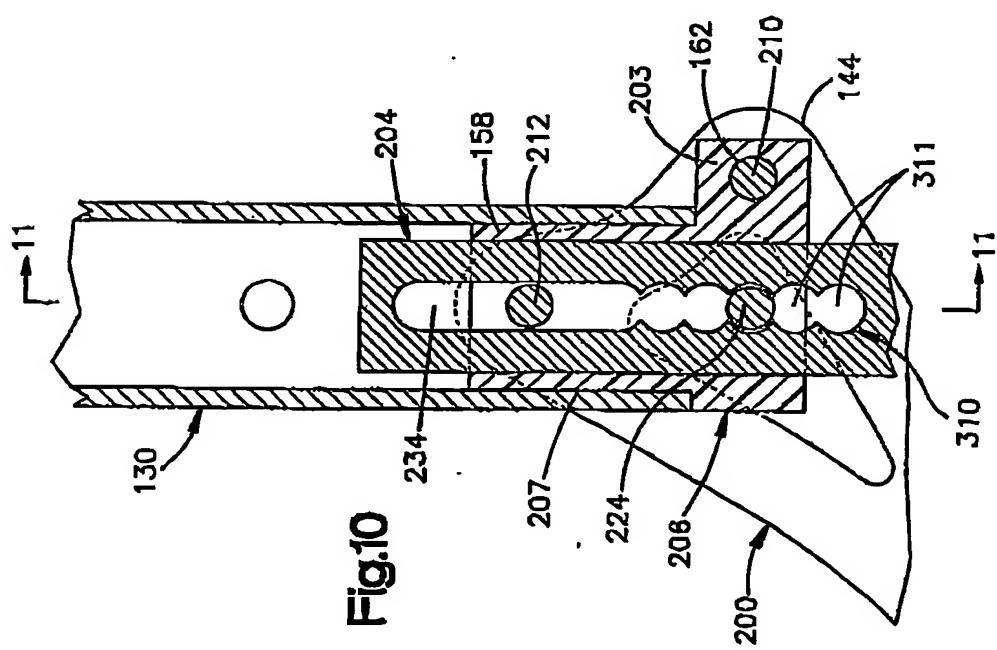


Fig.10

INTERNATIONAL SEARCH REPORT

Int. Application No
PCT/US 07414A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61G5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 500 102 A (HAURY GILBERT E ET AL) 19 February 1985 (1985-02-19) column 5, line 61 -column 6, line 17 figure 11	1,6
A		5
X	US 6 311 999 B1 (KUESCHALL RAINER) 6 November 2001 (2001-11-06) cited in the application column 10, line 19 - line 39; figure 13	1,6
X	US 4 592 570 A (NASSIRI JOE-MASSOUD) 3 June 1986 (1986-06-03) column 7, line 12 -column 8, line 20; figure 7	1

	-/-	

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents:

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Date of the actual completion of the International search

13 June 2003

Date of mailing of the International search report

23/06/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patenttaan 2
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Fax (491-70) 340-3016

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Godot, T

INTERNATIONAL SEARCH REPORT

Intern Application No
PCT/US 00/0414

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 152 543 A (LEWANDOWSKI RAYMOND P ET AL) 6 October 1992 (1992-10-06) column 4, line 45 -column 5, line 43; figures 6-8 -----	1

INTERNATIONAL SEARCH REPORT

SEARCH REPORT

Information about family members

Internal Application No
PCT/US 05/07414

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 4500102	A	19-02-1985	DE GB US US US	3341793 A1 2130154 A ,B 4805925 A 4595212 A 4721321 A	17-05-1984 31-05-1984 21-02-1989 17-06-1986 26-01-1988
US 6311999	B1	06-11-2001	CH AT AU AU DE DE DK EP ES NO NZ PT	689177 A5 196419 T 739573 B2 9710198 A 29816998 U1 59800273 D1 911009 T3 0911009 A1 2151759 T3 986036 A 333427 A 911009 T	30-11-1998 15-10-2000 18-10-2001 15-07-1999 19-11-1998 26-10-2000 08-01-2001 28-04-1999 01-01-2001 24-06-1999 26-05-2000 30-03-2001
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US 5152543	A	06-10-1992	DE GB NL	4137034 A1 2249760 A 9101859 A	21-05-1992 20-05-1992 01-06-1992

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TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371		ATTORNEY'S DOCKET NUMBER 12873.05197
INTERNATIONAL APPLICATION NO. PCT/US03/07414	INTERNATIONAL FILING DATE 03/11/2003	U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 60,364,301
TITLE OF INVENTION ADJUSTABLE SEATING SYSTEM		
APPLICANT(S) FOR DO/EO/US Invacare Corporation		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a submission under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a submission under 35 U.S.C. 371.</p> <p>3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.</p> <p>4. <input type="checkbox"/> The US has been elected (Article 31).</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ul style="list-style-type: none"> a. <input checked="" type="checkbox"/> Is attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> has been communicated by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). </p> <p>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)) <ul style="list-style-type: none"> a. <input type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).. </p> <p>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ul style="list-style-type: none"> a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> have been communicated by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. </p> <p>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p>		
Items 11 to 20 below concern document(s) or information included:		
<p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input type="checkbox"/> A preliminary amendment.</p> <p>14. <input type="checkbox"/> An Application Data Sheet under 37 CFR 1.76.</p> <p>15. <input type="checkbox"/> A substitute specification.</p> <p>16. <input type="checkbox"/> A power of attorney and/or change of address letter.</p> <p>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 37 CFR 1.821- 1.825.</p> <p>18. <input type="checkbox"/> A second copy of the published International Application under 35 U.S.C. 154(d)(4).</p> <p>19. <input type="checkbox"/> A second copy of the English language translation of the International application under 35 U.S.C. 154(d)(4).</p> <p>20. <input type="checkbox"/> Other items or information:</p>		

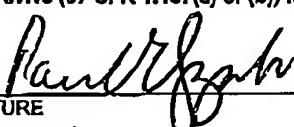
This collection of information is required by 37 CFR 1.414 and 1.491-1,492. The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 15 minutes to complete. Including gathering information, preparing, and submitting the completed form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

PTO-1390 (Rev. 02-2005)

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U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 60/364,301		INTERNATIONAL APPLICATION NO. PCT/US03/07414		ATTORNEY'S DOCKET NUMBER 12873.05197	
The following fees have been submitted				CALCULATIONS PTO USE ONLY	
21. <input checked="" type="checkbox"/> Basic national fee.....				\$ 300.00	
22. <input checked="" type="checkbox"/> Examination fee If International preliminary examination report prepared by USPTO and all claims satisfy provisions of PCT Article 33(1)-(4)..... \$100 All other situations..... \$200				\$ 200.00	
23. <input checked="" type="checkbox"/> Search fee Search fee (37 CFR 1.445(a)(2)) has been paid on the International application to the USPTO as an International Searching Authority..... \$100 International Search Report prepared and provided to the Office..... \$400 All other situations..... \$500				\$ 500.00	
TOTAL OF 21, 22 and 23 =				\$ 1000.00	
<input type="checkbox"/> Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing or computer program listing filed in an electronic medium). The fee is \$250 for each additional 50 sheets of paper or fraction thereof.					
Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof (round up to a whole number)		RATE	
- 100 =	/50 =			x \$250	\$
Surcharge of \$130.00 for furnishing the oath or declaration later than 30 months from the earliest claimed priority date (37 CFR 1.492(h)).				\$ 130.00	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	
Total claims	- 20 =		x \$ 50	\$	
Independent claims	- 3 =		x \$200	\$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$360	\$
TOTAL OF ABOVE CALCULATIONS =				\$ 1130.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. Fees above are reduced by ½.					
				SUBTOTAL =	\$
Processing fee of \$130.00 for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(i)).				+ \$	
				TOTAL NATIONAL FEE =	\$ 1130.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				+ \$	40.00
				TOTAL FEES ENCLOSED =	\$ 1170.00
				Amount to be refunded:	\$
				Amount to be charged:	\$
<p>a. <input checked="" type="checkbox"/> A check in the amount of \$ <u>1170.00</u> to cover the above fees is enclosed.</p> <p>b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>03-0172</u>. A duplicate copy of this sheet is enclosed.</p> <p>d. <input type="checkbox"/> Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.</p>					
NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.					
SEND ALL CORRESPONDENCE TO:					
CUSTOMER NO.					
24024					
 SIGNATURE Paul E. Szabo					
NAME 30,429					
REGISTRATION NUMBER					

HALTER & GRISWOLD LLP

CHECK NO.

105581

DATE	INVOICE NO.	DESCRIPTION	AMOUNT
6-17-05	12873.05197		\$1,170.00

PLEASE DETACH STATEMENT BEFORE DEPOSITING CHECK

FSC bank

105581# 0041202582# 130101812803#

CALFEE, HALTER & GRISWOLD LLP

Attorney Docket No. 12873.05197

DECLARATION
AND POWER OF ATTORNEY

ORIGINAL APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

ADJUSTABLE SEATING SYSTEM

the specification of which

is attached hereto.

was filed on 03/11/2003 as PCT International Application
No. PCT/US03/07414.

and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s) or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				Yes	No
PCT/US03/07414	PCT	03/11/2003	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

 Additional foreign application numbers are listed on a supplementary priority data sheet PTO/SB/02B attached hereto.

I hereby claim on information and belief the benefit of United States priority under 35 USC §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application(s) in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information material to the patentability of this application as defined in 37 CFR 1.56 which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

Application Serial Number	Filing Date	Legal Status

I hereby claim on information and belief the benefit of United States priority under 35 USC §119(e) of any United States provisional application(s) listed below:

Application Serial Number	Filing Date	Legal Status
60/364,301	03/12/2002	Expired

I hereby appoint the following attorney(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

The Attorneys Associated with Customer No. 24024

Direct all telephone calls to Paul E. Szabo at telephone number 216-622-8578 and faxes to (216) 241-0816.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First inventor: Matthew R. Cerreto

Inventor's signature: Matthew R. Cerreto

Date: 6/16/05

Residence: 193 East College Street, Apartment F

City: Oberlin

State: Ohio

Country: United States

Citizenship: United States

Mailing Address: 193 East College Street, Apartment F

City: Oberlin State: Ohio Zip: 44074

Country: United States

RECORDATION FORM COVER SHEET
PATENTS ONLY

To the Director of the U.S. Patent and Trademark Office: Please record the attached documents or the new address(es) below.

1. Name of conveying party(ies)

Matthew R. Cerreto

2. Name and address of receiving party(ies)

Name: Invacare Corporation

Internal Address: _____

Additional name(s) of conveying party(ies) attached? Yes No

3. Nature of conveyance/Execution Date(s):

Execution Date(s) _____

Assignment Merger
 Security Agreement Change of Name
 Joint Research Agreement
 Government Interest Assignment
 Executive Order 9424, Confirmatory License
 Other _____

Street Address: One Invacare WayCity: ElyriaState: OhioCountry: United States Zip: 44036Additional name(s) & address(es) attached? Yes No

4. Application or patent number(s):

 This document is being filed together with a new application.

A. Patent Application No.(s)

60/384,301; PCT/US03/07414

B. Patent No.(s)

Additional numbers attached? Yes No

5. Name and address to whom correspondence concerning document should be mailed:

Name: Paul E. SzaboInternal Address: 1400 McDonald Investment CenterStreet Address: 800 Superior AvenueCity: ClevelandState: Ohio Zip: 44114-2688Phone Number: 216-622-8578Fax Number: 216-241-0816

Email Address: _____

6. Total number of applications and patents involved:

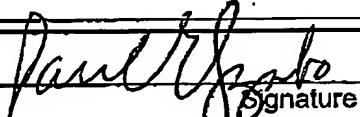
7. Total fee (37 CFR 1.21(h) & 3.41) \$40.00

Authorized to be charged by credit card
 Authorized to be charged to deposit account
 Enclosed
 None required (government interest not affecting title)

8. Payment Information

a. Credit Card Last 4 Numbers _____
Expiration Date _____b. Deposit Account Number 03-0172Authorized User Name Paul E. Szabo

9. Signature:

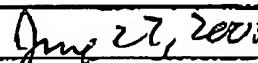

Signature

Paul E. Szabo

Name of Person Signing

Total number of pages including cover sheet, attachments, and documents:

3


Date

ASSIGNMENT

For One Dollar (\$1.00) and other good and valuable consideration received of the hereinafter named assignee, receipt of which is hereby acknowledged, I, the undersigned, **Matthew R. Cerreto**, 193 East College Street, Apartment F, Oberlin, Ohio 44074, assign to **Invacare Corporation**, having a place of business at One Invacare Way, Elyria, OH 44035, its successors and assigns, the entire right, title and interest, so far as concerns the United States and the Territories and Possessions thereof and all foreign countries, in and to the inventions in

ADJUSTABLE SEATING SYSTEM

set forth in United States Provisional Patent Application No. 60/364,301, filed on March 12, 2003, PCT International Application No. 03/07414, filed on March 11, 2003, and Canadian Patent Application No. 2,471,598, filed on March 11, 2003, and any and all other applications for Letters Patent on said inventions in the United States and in all countries foreign to the United States, including but not limited to all provisional, divisional, renewal, substitute, continuation, PCT and Convention applications based in whole or in part upon said inventions or upon said applications, and any and all Letters Patents and reissues and extension of Letters Patent granted for said inventions or upon said applications, and every priority right that is or may be predicated upon or arise from said inventions, said applications and said Letters Patent; said assignee being hereby authorized to file patent applications in any or all countries on any or all said inventions in the name of the undersigned or in the name of said assignee or otherwise as said assignee may deem advisable; the Commissioner of Patents of the United States of America and the empowered officials of all other governments being hereby authorized to issue or transfer all said Letters Patent to said assignee in accordance herewith; this assignment being under covenant, not only that full power to make the same is had by the undersigned, but also that such assigned right is not encumbered by any grant, license, or other right heretofore given, and that the undersigned will do all acts reasonably serving to assure that the said inventions, patent applications and Letters Patent shall be held and enjoyed by said assignee as fully and entirely as the same could have been held and enjoyed by the undersigned if this assignment had not been made, and particularly to execute and deliver to said assignee all lawful documents including petitions, specifications, oaths, assignments, invention disclaimers, and lawful affidavits in form and in substance which may be requested by said assignee, to furnish said assignee with all facts relating to said inventions or the history thereof and any and all documents, photographs,

models, samples or other physical exhibits which may be useful for establishing the facts of conception, disclosure and reduction to practice of said inventions, and the testify in any proceedings relating to said inventions, patent applications and Letters Patent.

Date: 6/16/05

Matthew R. Cerreto
Matthew R. Cerreto

On this, the 16th day of June, 2005, personally appeared before me Matthew R. Cerreto to me known to be the person named in and who executed the above Assignment, and acknowledged to me that he executed the same for the uses and the purposes therein mentioned.

SEAL



JOHN BERTRAND
NOTARY PUBLIC
STATE OF OHIO
Comm. Expires
February 27, 2010

John Bertrand
NOTARY PUBLIC

CERTIFICATE OF MAILING

I hereby certify that this *Information Disclosure Statement* is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this date, June 26, 2005.



<u>Customer Number</u>
24024

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Matthew R. Cerreto)	Examiner: Not yet assigned
Serial No.:)	Art Unit: Not yet assigned.
Filed:)	Attorney Docket No.: 12873/05197
For: ADJUSTABLE SEATING SYSTEM)	
)	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

In accordance with the duty of disclosure under 37 C.F.R. § 1.56, Applicant hereby notifies the U.S. Patent and Trademark Office of the documents which are listed on the attached PTO/SB/08 A & B forms and/or listed herein and which the Examiner may deem material to patentability of the claims of the above-identified application.

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicant does not waive any right to take any action that would be appropriate to antedate or otherwise remove any listed document as a competent reference against the claims of the present application.

FOREIGN LANGUAGE DOCUMENTS

In compliance with the concise explanation requirement under 37 C.F.R. § 1.98(a)(3) for foreign language documents, Applicant encloses herewith a copy of a Communication from a foreign patent office in a counterpart application citing such documents, together with that portion of the Communication indicating the degree of relevance found by the foreign patent office.

INFORMATION DISCLOSURE STATEMENT

Attorney Docket No. 12873/05197

In compliance with the concise explanation requirement under 37 C.F.R. § 1.98(a)(3) for foreign language documents, Applicant submits the following explanations:

Complete English translations of foreign language documents are being submitted herewith, and therefore no concise explanation for such documents is required.

CERTIFICATION AND FEE PAYMENT INFORMATION

The present Information Disclosure Statement is being filed: (1) No later than three months from the application's filing date; (2) Before the mailing date of the first Office Action on the merits (whichever is later); or (3) Before the mailing date of the first Office Action after filing a request for continued examination under 37 C.F.R. § 1.114, and therefore, no Statement under 37 C.F.R. § 1.97(e) or fee under 37 C.F.R. § 1.17(p) is required. If this is not the case, the patent office is hereby authorized to charge any related fee to Deposit Account No. 030172.

The present Information Disclosure Statement is being filed three months or fewer from a Communication from a foreign patent office and Applicant submits the following Statement Under 37 C.F.R. § 1.704(d). Each item of information contained in the Information Disclosure Statement was cited in a Communication from a foreign patent office in a counterpart application and this Communication was not received by any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of the Information Disclosure Statement.

The present Information Disclosure Statement is being filed after the later of three months from the application's filing date and mailing date of the first Office Action on the merits, but before a Final Office Action, Notice of Allowance, or an action that otherwise closes prosecution in the application (whichever is earlier), and therefore Applicant submits the following Statement under 37 C.F.R. § 1.97(e). No fee under 37 C.F.R. § 1.17(p) is required. If this is not the case, the patent office is hereby authorized to charge any related fee to Deposit Account No. 030172

Each item of information contained in this information disclosure statement was cited in a Communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.

No item of information contained in this information disclosure statement was cited in a Communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 CFR § 1.56(c) more than three months prior to the filing of this statement.

INFORMATION DISCLOSURE STATEMENT

Attorney Docket No. 12873/05197

The present Information Disclosure Statement is being filed (without a Statement under 37 C.F.R. § 1.97(e)) after the later of three months from the application's filing date and the mailing date of the first Office Action on the merits, but before a Final Office Action, Notice of Allowance, or an action that otherwise closes prosecution in the application (whichever is earlier). Accordingly, Applicant submits the fee required under 37 C.F.R. § 1.17(p). The fee is being paid in the following manner:

A check is attached in the amount of \$180.00 as required under 37 § 1.17(p).

The patent office is hereby authorized to charge the amount of \$_____ and any related fee to Deposit Account No. 030172

The present Information Disclosure Statement is being filed after the mailing of a final Office Action, Notice of Allowance or an action that otherwise closes prosecution in the application, but on or before the payment of the issue fee. Accordingly, Applicant submits the following Statement under 37 C.F.R. § 1.97(e) along with the fee required under 37 C.F.R. § 1.17(p).

Each item of information contained in this information disclosure statement was cited in a Communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.

No item of information contained in this information disclosure statement was cited in a Communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this statement.

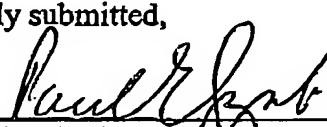
AND, the fee is being paid in the following manner:

A check is attached in the amount of \$_____ as required under 37 § 1.17(p).

The patent office is hereby authorized to charge the amount of \$_____ and any related fee to Deposit Account No. 030172

Respectfully submitted,

By:

Date: June 22, 2005
Paul E. Szabo, Reg. No. 30,429

CALFEE, HALTER & GRISWOLD LLP
800 Superior Avenue, Suite 1400.
Cleveland, OH 44114-2688
(216) 622-8578

PTO/5B/08A (08-03)

Approved for use through 07/31/2006, OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
to a collection of information unless it contains a valid OMB control number.

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449/PTO

Complete if Known

Application Number

Filing Date

First Named Inventor

Art Unit

Examiner Name

Attorney Docket Number 12873.05122

Sheet 1 of 2

Attorney Docket Number 12873.05122

U. S. PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS

Examiner Signature _____ **Date Considered** _____

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 2

Complete if Known

Application Number	
Filing Date	
First Named Inventor	Matthew R. Cerreto
Art Unit	
Examiner Name	
Attorney Docket Number	12873.05197

NON PATENT LITERATURE DOCUMENTS

Examiner Signature _____ **Date Considered** _____

***EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 12873/04535	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 03/07414	International filing date (day/month/year) 11/03/2003	(Earliest) Priority Date (day/month/year) 13/03/2002
Applicant INVACARE CORPORATION		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

contained in the international application in written form.

filed together with the international application in computer readable form.

furnished subsequently to this Authority in written form.

furnished subsequently to this Authority in computer readable form.

the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. Certain claims were found unsearchable (See Box I).

3. Unity of invention is lacking (see Box II).

4. With regard to the title,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the abstract,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

as suggested by the applicant.

because the applicant failed to suggest a figure.

because this figure better characterizes the invention.

None of the figures.

INT'L. NATIONAL SEARCH REPORT

Internat'l Application No
PCT/US 03/07414A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61G/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 500 102 A (HAURY GILBERT E ET AL) 19 February 1985 (1985-02-19) column 5, line 61 -column 6, line 17 figure 11	1,6
A		5
X	US 6 311 999 B1 (KUESCHALL RAINER) 6 November 2001 (2001-11-06) cited in the application column 10, line 19 - line 39; figure 13	1,6
X	US 4 592 570 A (NASSIRI JOE-MASSOUD) 3 June 1986 (1986-06-03) column 7, line 12 -column 8, line 20; figure 7	1
	—/—	

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the International filing date
- "L" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the International filing date but later than the priority date claimed

- "T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "Z" document member of the same patent family

Date of the actual completion of the International search

13 June 2003

Date of mailing of the International search report

23/06/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx. 31 651 cpo nl,
Fax (+31-70) 340-3016

Authorized officer

Godot, T

INT'L. PATENT SEARCH REPORT

Intern. Application No.
PCT/US 03/07414

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 152 543 A (LEWANDOWSKI RAYMOND P ET AL) 6 October 1992 (1992-10-06) column 4, line 45 -column 5, line 43; figures 6-8	1

INVENTIONAL SEARCH REPORT

Information on relevant family members

Intern. Appl. No.
PCT/US 00/07414

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 4500102	A	19-02-1985	DE GB US US US	3341793 A1 2130154 A ,B 4805925 A 4595212 A 4721321 A		17-05-1984 31-05-1984 21-02-1989 17-06-1986 26-01-1988
US 6311999	B1	06-11-2001	CH AT AU AU DE DE DK EP ES NO NZ PT	689177 A5 196419 T 739573 B2 9710198 A 29816998 U1 59800273 D1 911009 T3 0911009 A1 2151759 T3 986036 A 333427 A 911009 T		30-11-1998 15-10-2000 18-10-2001 15-07-1999 19-11-1998 26-10-2000 08-01-2001 28-04-1999 01-01-2001 24-06-1999 26-05-2000 30-03-2001
US 4592570	A	03-06-1986	CA GB	1225918 A1 2148805 A ,B		25-08-1987 05-06-1985
US 5152543	A	06-10-1992	DE GB NL	4137034 A1 2249760 A 9101859 A		21-05-1992 20-05-1992 01-06-1992